

Applicant : David M. Baggett Art Unit : 3629
Serial No. : 09/877,159 Examiner : Janice A. Mooneyham
Filed : June 8, 2001 Conf. No. : 1014
Title : TECHNIQUE FOR PRODUCING CONSTRUCTED FARES

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sirs:

Appellant respectfully requests reconsideration of the Board of Patent Appeals and Interferences Decision on Appeal dated March 10, 2008, under 37 CFR 41.50(b) (2). Appellant believes the Board misapprehended or overlooked the following points in rendering their decision.

Appellant conceived of a novel technique to produce “constructed fares.” The technique takes into consideration that very few cities are actually part of arbitraries. A key to rapidly enumerating constructed fares therefore is to start only with interior cities known to appear in some arbitraries. The technique also takes into consider that it is only necessary to consider those cities as gateways if the city is involved in some arbitrary whose interior city is the city currently being examined in the process.¹ Appellant’s invention accomplishes this in part by determining interior cities that appear with gateway cities in arbitraries for an airline, searching a database having published fares for gateway cities corresponding to the determined interior cities appearing in the arbitraries and applying an arbitrary corresponding to one of the interior cities to

¹ See Appellant's specification page 9, lines 1-13.

I hereby certify that this paper was filed with the Patent and Trademark Office using the EFS-WEB system on this date: May 05, 2008

a published fare involving one of the gateway cities that corresponds to the determined interior cities.

Appellant's approach uses a novel pre-processing arrangement of the data used to produce constructed fares, as part of an algorithm that permits the "constructed fares" to be produced in a very efficient manner.

II. The Board misapprehended Appellant's arguments on Brief

In sustaining the Examiner's rejection, the Board misapprehended portions of Appellant's argument, which had a subsequent bearing on the Board's decision.²

"The Appellant contends that none of the art applied, nor the background in the Specification, describes the preprocessing limitation in claim 1 (Appeal Br. 12:Last full ¶)." This characterization is correct.

"The Appellant argues that Gardner does not describe fare construction, but merely the accessing of published and unpublished fares (Appeal Br. 13:Second to last ¶)." The Board misapprehended this argument.³ Appellant argued that Gardner did not teach how to construct unpublished fares, but merely taught to access a table or database of unpublished fares.

"As a result, the Appellant concludes that Gardner's fare components are not directed to the use of arbitraries (Appeal Br. 15:Top ¶)." The Board misapprehended this argument.⁴ Appellant argued that the fare components mentioned by Gardner are not directed to the use of arbitraries or unpublished fares, as contended by the examiner. Appellant was responding to the examiner's

² Throughout this paper, excerpts from the Board's decision and the prior art are set out in **"Bold small type face."**

³ Appellant argued that:

The examiner also relies on Figure 7 of Gardner, Unpublished Fare Retrieval, Published Fare Retrieval, page 7, [0093-01021]. However, these teachings are even less relevant to this claim feature of the claims in general. In these paragraphs, Gardner merely describes a system that can access published fares and unpublished fares. However, Gardner offers no techniques for construction of the unpublished fares. Rather, Gardner teaches to access an unpublished fares table. Indeed, Gardner does not even describe what is meant by the unpublished fares that the examiner relies on. **(Appeal Br. 13:Second to last ¶)**

⁴ Appellant argued that:

... In the quoted passages Gardner discusses fare components. However, the concept of fare components is directed to finding fares that can be used with flights to produce travel options. They have no relevance to the claimed "fare construction." ATPCO clearly makes note of the idea that arbitraries cannot be priced in fare quote systems. Hence, the fare components mentioned by Gardner are not directed to the use of arbitraries or unpublished fares, as contended by the examiner... **(Appeal Br. 15:Top ¶)**

contention that Gardner had published fares and that ATPCO disclosed "arbitrary fares" (as characterized by the examiner), and therefore Gardner had taught fare construction by "Figure 7b Fare Component." Appellant argued that Gardner's fare components are trip segments not fare construction: "Fare component identification module 184 identifies possible trip components within an itinerary. This is done by grouping the itinerary segments together in different ways to form possible fare components."⁵ Appellant also argued that ATPCO clearly taught that: "arbitraries cannot be priced in fare quote systems"⁶ that arbitraries were not "fares" and accordingly, fare components do not use arbitraries in the manner that the examiner argued.

"The Appellant further argues that Gardner's published fares do not include travel between gateway and minor cities, because if it did, there would be no need for ATPCO's fare construction (Appeal Br. 13:Last ¶ - 14:First ¶ following the ATPCO extract)." The Board misapprehended this argument.⁷ Appellant argued that both the examiner's definition that a published fare would include gateway cities and minor cities, and thus, the implication that they [published fares] would be "constructed fares" was erroneous.

"The Appellant contends that any combination of ATPCO (sic) and Gardner would result in a simple cross product of all published fares and arbitraries (Appeal Br. 14:Third from bottom ¶)." The Board misapprehended this argument.⁸ Appellant argued that: "... any purported combination of Gardner with ATPCO and Applicant's admitted prior art would merely result in the conventional approach, a "cross product,"

"The Appellant finally argues that Gardner would not incorporate ATPCO's fare construction because Gardner fails to describe any of ATPCO's features (Appeal Br.15:Bottom ¶ - 16:Second ¶)." The Board misapprehended

⁵ Gardner [0096]

⁶ ATPCO Page 58.

⁷ Appellant argued that:

The examiner, relying on page 58 from ATPCO, argues that: "A published fare is defined in ATPCO as an amount published for use in pricing air transportation from one city to another city." Appellant does not dispute this. However the examiner then goes on to say that: "This would include gateway cities and minor cities." Appellant disagrees. Indeed, if this conclusion could be drawn from ATPCO, there would be no need for fare construction or unpublished fares since if a published fare was defined a[s] (sic) travel between gateways and minor cities all fares would be published fares and there would not be any unpublished fares, at least as that term is used by ATPCO and Appellant.

In no sense therefore can the term "published fare" be construed to "include gateway cities and minor cities." as contended by the examiner. (Appeal Br. 13:Last ¶ - 14:First ¶ following the ATPCO extract).

⁸ Appellant contends that any purported combination of Gardner with ATPCO and Applicant's admitted prior art would merely result in the conventional approach a "cross product,""

this argument.⁹ Appellant did not argue that Gardner would not incorporate ATPCO fare construction, because Gardner failed to describe any of ATPCO's features. Rather, Appellant questioned the need for ATPCO in the first instance. Appellant reasoned that if Gardner truly had taught an algorithm to produce constructed fares, as the examiner had contended¹⁰ and the Board at least had implicitly concurred with¹¹ then Gardner would inherently had to discuss all of the terms and features of ATPCO (or equivalents). Because Gardner did not discuss these features, the only reasonable inference was that Gardner did not teach a technique to produce "constructed fares." Therefore, the presence of ATPCO provides a colorable, but ultimately unsustainable position that the combination suggested claim 1.

III. The Board failed to consider every claim limitation in sustaining the rejection of claim 1

The Board applies a novel approach to analyzing whether a claim is obvious. The Board started their analysis with the last, substantive "step" (as characterized by the Board). The Board improperly read out of that step, a substantive limitation, and as a result divorced that step from preceding steps of the claim. This approach effectively allowed the Board to view those preceding steps as inherent, and avoid specifically addressing the novel features of those steps.

⁹ (See note 3 above for **Appeal Br.15:Bottom ¶**)

The examiner's motivation to incorporate "arbitrary fares" as taught by ATPCO with the published fares as taught by Gardner is that Gardner discloses unpublished fares, "which is an add-on amount and thus an arbitrary for the purpose of providing better passenger service." However this motivation is illogical. First, ATPCO clearly sets out that arbitraries are not fares. Second, by the examiner's own admission, ATPCO discloses published fares and indeed discloses the very "add-ons" or arbitraries used to extend the published fares, indeed ATPCO also discloses unpublished fares. Why would one of ordinary skill in the art use ATPCO to include arbitraries and thus modify Gardner, which fails to disclose any of these features?

Appellant further contends that the motivation of "providing better passenger service" is without import to the claimed invention, because Gardner fails to disclose any fare construction process. Rather, Gardner merely accesses a database of unpublished fares, e.g., the conventional "The Unpublished Fares Product" from Airline Tariff Publishing Company (ATPCO). Gardner is directed to offering travel solutions not fare construction. Thus, because Appellant's invention is directed to more efficient techniques of producing "constructed fares," the motivation predicated on providing "better passenger service" is insufficient and irrelevant. (**Appeal Br. 16:Second ¶**).

¹⁰ See examiner's answer pages 13-14.

¹¹ See Board's decision pages 13-14

Appellant contends that the Board's approach was improper. "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). This is true even if the Board views the non-considered words as indefinite. *Id.* See also *In re Lowry*, 32 F.3d 1579, 32 U.S.P.Q.2d 1031 (Federal Circuit 1994) "The Patent and Trademark Office (PTO) must consider all claim limitations when determining patentability of an invention over the prior art." (Citations omitted.).

The Board failed to consider all of the limitations of step [3], by reasoning: "An add-on fare is an arbitrary [FF 141. An unpublished fare is the combination of an add-on amount and a published fare [FF 151. Thus, every unpublished fare stored in Gardner was constructed by the process of step [3] in claim 1. So now the issue becomes whether steps [1] and [2] were predictable to one of ordinary skill in constructing these published fares." The Board overlooks that step [3] requires "applying an arbitrary ... to a published fare, involving one of the gateway cities that corresponds to the determined interior cities appearing in the arbitraries." The determined interior cites appearing in the arbitraries however is the result of the pre-processing that is recited earlier in the claim.

The Board's overlooks that the unpublished fares in Gardner were not constructed by this step [3]. Step [3] does not merely require applying any arbitrary to any published fare as described in ATPCO, and reasoned by the examiner and the Board, but instead, requires "applying an arbitrary ... to a published fare involving one of the gateway cities that corresponds to the determined interior cities appearing in the arbitraries"

Therefore, the Board did not considered all of the limitations of this feature of claim 1.

IV. The Office denies Appellant the opportunity to properly reply to the rejections by failing to identify where the critical teachings were found in the cited references

The Board isolated step [3] from the claim, overlooked a novel feature in step [3], and in effect, used an inherency argument to dismiss the remaining elements of claim 1 without clearly supporting their reasons for doing so. The Board used inherency when reasoning on the one hand that: "The Examiner implicitly found that one of ordinary skill would have used the air fare construction method of ATPCO to provide improved passenger service and concluded that it would have been obvious to a person of ordinary

skill in the art to have applied ATPCO's use of arbitraries and air fare construction to Gardner (Answer 3-5)," and on the other hand, that: "Whether the preprocessing was performed directly in Gardner's system or indirectly by Gardner relying on ATPCO's fare construction is not pertinent to whether their combination described the limitations of claim 1." The Board did not provide any basis to support their conclusion that the Examiner "implicitly found that one of ordinary skill would have used the air fare construction method of ATPCO," because this conclusion is clearly not supported by the record.

As the Federal Circuit pointed out in *In re Lee* 277 F.3d 1338, 61 U.S.P.Q.2d 1430 (Fed. Cir. 2002), "Tribunals of the PTO are governed by the Administrative Procedure Act, and their rulings receive the same judicial deference as do tribunals of other administrative agencies. *Dickinson v. Zurko*, 527 U.S. 150, 119 S.Ct. 1816, 144 L.Ed.2d 143, 50 USPQ2d 1930 (1999)."

As the Federal Circuit noted in *Lee*:

The Administrative Procedure Act, which governs the proceedings of administrative agencies and related judicial review, establishes a scheme of "reasoned decision making." Not only must an agency's decreed result be within the scope of its lawful authority, but the process by which it reaches that result must be logical and rational.

Allentown Mack Sales and Service, Inc. v. National Labor Relations Bd., 522 U.S. 359, 374, 118 S.Ct. 818, 139 L.Ed.2d 797 (1998) (citation omitted). This standard requires that the agency not only have reached a sound decision, but have articulated the reasons for that decision. The reviewing court is thus enabled to perform meaningful review within the strictures of the APA, for the court will have a basis on which to determine "whether the decision was based on the relevant factors and whether there has been a clear error of judgment." *Citizens to Preserve Overton Park v. Volpe*, 401 U.S. 402, 416, 91 S.Ct. 814, 28 L.Ed.2d 136 (1971).¹²

¹² In *In re Huston* 308 F.3d 1267 (Fed. Cir. 2002) the Fed. Cir distinguished *Huston* from *Lee* regarding the proposition that the Board may not rely on general knowledge to negate patentability.

Lee involved a situation in which the Board relied on its "general knowledge to negate patentability." *In re Lee*, 277 F.3d at 1345, 61 USPQ2d at 1435. In such circumstances we held that such "knowledge must be articulated and placed on the record." *Id.* The court further explained "that 'deficiencies of the cited references cannot be remedied by the Board's general conclusions about what is 'basic knowledge' or 'common sense.' " *Id.* at 1344, 61 USPQ2d at 1434-35 (quoting *In re Zurko*, 258 F.3d 1379, 1385, 59 USPQ2d 1693, 1697 (Fed.Cir.2001)) (citation omitted).

The Board was clearly uncertain whether or not Gardner taught a technique for producing constructed fares.¹³ However, the examiner's rejection, which Appellant had appealed from and the Board has sustained, is clearly predicated on Gardner explicitly teaching such a process of producing constructed fares.¹⁴ The examiner had merely relied upon ATPCO to provide definitions for terms used in Appellant's claims.¹⁵ Therefore, neither the Board nor the examiner has clearly articulated for the record where the critical teachings of pre-processing were found and thus failed to meet their burden of reasoned decision-making under APA.

The Board summarily dismisses the pre-processing features by arguing that: "Therefore, some preprocessing necessarily occurred in Gardner to create unpublished fares. Whether the preprocessing was performed directly in Gardner's system or indirectly by Gardner relying on ATPCO's fare construction is not pertinent to whether their combination described the limitations of claim 1."¹⁶ As the Federal Circuit further observed in *Lee*:

Judicial review of a Board decision denying an application for patent is thus founded on the obligation of the agency to make the necessary findings and to provide an administrative record showing the evidence on which the findings are based, accompanied by the agency's reasoning in reaching its conclusions. See *In re Zurko*, 258 F.3d 1379, 1386, 59 USPQ2d 1693, 1697 (Fed.Cir.2001) (review is on the administrative record); *In re Gartside*, 203 F.3d 1305, 1314, 53 USPQ2d 1769, 1774 (Fed.Cir.2000) (Board decision "must be justified within the four corners of the record"). 277 F.3d at 1344.

Here we confront quite a different situation. Despite the Board's passing reference to "common knowledge and common sense," *Huston*, slip op. at 7, the Board in fact has not relied on its own general knowledge. Rather, it has found the motivation in the prior art references themselves. Its conclusions are cryptic, but they are supported by the record. The Paul reference indeed is quite specific in describing the disadvantages of the radio frequency system used in *Dudley*."

Appellant however cites *Lee* for its treatment of the Administrative Procedure Act.

¹³ Compare Board's decision page 13, line 25 (Gardner describes storage of unpublished fares) with page 14, lines 3-4 (some preprocessing necessarily occurred in Gardener to create unpublished fares).

¹⁴ See pages 3-4 of Office Action 10-11-2005 where according to the examiner Gardner teaches all of the features and on page 4 where the examiner uses ATPCO to define the terms published fare, addons, arbitraries, and so forth.

¹⁵ See also the Examiner's Answer pages 13-18 and especially page 13 where the examiner stated: "The Examiner also looked to ... the prior art supplied by the Examiner, Airline Tariff Publishing Company Construction Manual published May 22, 1995 to provide guidance in interpreting claim language.

¹⁶ Board decision page 14, lines 3-7.

Appellant contends that the Board's avoidance of addressing exactly in which of the references and where in the reference the constructed fares are produced, and indeed to take the position that it does not matter, denies Appellant of the notice necessary to apprise Appellant of the basis for the rejection, and thwarts subsequent judicial review in contravention of the Administrative Procedure Act.

V. The Board's reasoning improperly relies on inherency

Appellant contends that because the Board did not explicitly identify where the features were found and in which references the features were found, in effect, reasoned that the features were somehow inherent in the combination. Inherency, however, has no place in an obviousness rejection. *In re Dillon*, 919 F.2d 688, at 718, 16 U.S.P.Q.2d 1897 (Fed. Cir. 1990).

Arguments based on "inherent" properties can not stand when there is no supporting teaching in the prior art. However, it has long been established that inherency and obviousness are distinct concepts. *In re Spormann*, 363 F.2d 444, 448, 53 CCPA 1375, 150 USPQ 449, 452 (CCPA 1966): "[T]he inherency of an advantage and its obviousness are entirely different questions. That which may be inherent is not necessarily known. Obviousness cannot be predicated on what is unknown." When the PTO asserts that there is an explicit or implicit teaching or suggestion in the prior art, the PTO must produce supporting references. *In re Yates*, 663 F.2d 1054, 1057, 211 USPQ 1149, 1151 (CCPA 1981).

It necessarily follows, therefore, that the Board improperly ignored the features of the preprocessing. Having failed to point out those features in the teachings of either of the references, the Board cannot reason that somehow they are inherent in the combination.

VI. The Board's misapprehended the references

The Board stated that: "Gardner describes the storage of unpublished fares [FF 221]." Appellant contends that this construction of Gardner is correct. It is Appellant's contention that Gardner

stored a product such as a list of unpublished fares. Appellant gives one such example as: "The Unpublished Fares Product from ATPCO."¹⁷ Appellant has consistently argued that Gardner does not teach any algorithm or technique to produce, that is, make the "constructed fares."

However, thereafter the Board misapprehends Gardner in concluding that: "Unpublished fares, by definition, are unpublished. They must be constructed as the combination of an add-on amount and a published fare amount resulting in an amount used in pricing air transportation from one city to another city [FF 151]. Therefore, some preprocessing necessarily occurred in Gardner to create unpublished fares." Neither the examiner nor the Board has provided any reasoning that "some pre-processing necessarily occurred" in Gardner. Pre-processing neither follows from Gardner because constructed fares are "an add-on amount and a published fare," as found by the Board, nor from any other teachings in Gardner or ATPCO. It is Appellant's contention that Gardner uses the Unpublished Fares Product or an equivalent, that is, a list of fares that are stored in a database 194 in Figure 7a of Gardner.

More importantly, Appellant did not claim "some preprocessing," as the Board found,¹⁸ but specifically claimed: "preprocessing by: determining interior cities that appear with gateway cities in arbitraries for an airline; and "searching a database having published fares for gateway cities corresponding to the determined interior cities appearing in the arbitraries." Neither of these features is suggested in any combination of the cited references.

Claim 1 takes advantage of the recognition by the inventor that very few cities are actually part of arbitraries.¹⁹ Claim 1 also takes advantage of the recognition by the inventor that when producing constructed fares: "One key to rapidly enumerating constructed fares, therefore, is to start only with interior cities known to appear in some arbitraries."²⁰ This recognition of the desirability of the claimed preprocessing by determining interior cities that appear with gateway cities in arbitraries for an airline is neither explicitly nor implicitly mentioned in ATPCO, Appellant's Admitted Prior Art or Gardner, whether those references are taken alone or in any combination. Claim 1 further takes advantage of the recognition by the inventor that: "... it is

¹⁷ See Appellant's specification page 2.

¹⁸ Board's decision page 14, line 3

¹⁹ Appellant's specification page 9, lines 2-3.

²⁰ Id., line 5.

only necessary to consider those cities as gateways, if the city is involved in some arbitrary whose interior city is the city currently being examined in the process.”

The Board, in addressing the search feature, framed²¹ the question as: “whether one would have searched for a gateway city corresponding to a given arbitrary to look up a published fare.” The Board either misapprehended the claimed feature or failed to give patentable weight to the entire feature. Claim 1 does not broadly require searching for a gateway city corresponding to a given arbitrary to look up a published fare, but rather specifically requires searching published fares for gateway cities corresponding to the determined interior cities appearing in the arbitraries. This feature follows from the preceding “determining” feature in claim 1 based on the aforementioned recognition by the inventor of the desirability of searching published fares for gateway cities corresponding to the determined interior cities appearing in the arbitraries, rather than as reasoned by the Board, of looking up a published fare for “gateway city corresponding to a given arbitrary.” Recognition of sources of problems has long been established as indicative of invention. See for instance *Eibel Process Co. v. Minnesota & Ontario Paper Co.* 261 U.S. 45, 43 S.Ct. 322, 67 L.Ed. 523 (1923); *Application of Conover* 304 F.2d 680, 134 U.S.P.Q. 238 (CCPA 1962).

²¹ So now the remaining issue is whether one would have searched for a gateway city corresponding to a given arbitrary to look up a published fare. Again, an unpublished fare is the sum of an arbitrary and a published fare [FF 161] and one gateway city must be common between the arbitrary and published fare [FF 171]. Having determined the interior and one gateway city from the arbitrary, it is required that the published fare include the same gateway city as in the arbitrary. The only way to ensure this is by restricting the domain of published fares to those having this gateway. So now the only issue is whether the published fares are searched.

The Appellant argues, *supra*, that searching is not required because the fares may be determined by a cross product. But this merely glosses over the simple fact that a cross product computation itself requires a search for the operands of each term in the cross product. The fact that a given arbitrary may only be combined with a subset of published fares necessarily requires searching among the published fares for those that may be combined. The Appellant argues that there are no teachings of constructing a database of gateways based on interior cities appearing in arbitraries (Reply Br. 4:Second ¶). We find this argument is not commensurate with the scope of the claim. Claim 1 only requires that a data base is searched for gateway cities corresponding to determined interior cities appearing in arbitraries. This limitation says nothing regarding how such a database is constructed. However, the requirement for a published fare for a gateway city matching the gateway city in the now determined arbitrary necessitates that the database having such a fare exist.

Further, we find that whether a search occurs in a cross product computation or a more direct computation does not negate this basic requirement. The Appellant makes no contention that a cross product computation would not involve such a search, but merely contends that a cross product would compute millions of fares (Appeal Br. 10:Last full ¶). Thus, we conclude that step [2] of claim 1 is performed in the preprocessing to create Gardner's unpublished fares table. (Board's Decision page 15, line 3 to page 16, line 7).

In claim 1, the database has published fares for gateway cities corresponding to the determined interior cities appearing in the arbitraries, whereas in the construction given by the Board for the combination of ATPCO, Appellant's Admitted Prior Art and Gardner, the search for a published fare is without regard to any special limitation on the database.

The Board also reasons that: "The Appellant argues that there are no teachings of constructing a database of gateways based on interior cities appearing in arbitraries (Reply Br. 4:Second ¶). We find this argument is not commensurate with the scope of the claim. Claim 1 only requires that a data base is searched for gateway cities corresponding to determined interior cities appearing in arbitraries." Appellant contends that the Board overlooks the complete searching limitation by dismissing Appellant's argument. The feature is: "searching a database having published fares for gateway cities corresponding to the determined interior cities appearing in the arbitraries." The Board, in effect, construes the feature as "searching a database having published fares for gateway cities," and overlooks the remainder of the feature.

Accordingly, Appellant believes that the Board has misapprehended the teachings of the primary and secondary references and has overlooked several of Appellant's arguments, and therefore should not have sustained the examiner.

VII. The Board used improper hindsight reconstruction to incorporate a hash table with the teachings of the cited references

The Board refused to sustain the rejection of Claims 2-6, 21, 23-27, 42 and 52-55. In reversing the examiner's rejection of these claims, the Board held: "However, the use of both indexes and hash tables are step limitations in method claim 2, and the Examiner has erred by not providing prima facie evidence that these limitations are described or suggested by either Gardner or ATPCO."²²

However, the Board entered their own rejection of Claims 2-6, 21, 23-27, 42 and 52-55, as being obvious over Gardner, ATPCO, the admitted prior art, and newly cited references Tremblay and Wiederhold.

²² Board decision page 16.

The Board's reasoning that claim 2 merely requires use of a "hash table indexed by those cities"²³ overlooks the features of claim 2. Appellant contends that the Board fails to take into consideration that claim 2 requires: "accessing a hash table indexed by an airline, interior-city pair to return a list of gateway cities for which an airline has arbitraries that specify the interior city." Claim 2 requires a specific arrangement of a hash table with specific indexes that are part of a specific embodiment of the preprocessing of claim 1.

In upholding the rejection of claim 1, the Board previously found that: "Therefore, some preprocessing necessarily occurred in Gardner to create unpublished fares." In Appellant's view, the Board never identified where or in which reference the features of the preprocessing were taught. The Board did not offer any reasoning why the claimed preprocessing "necessary occurred" and the Board misconstrued the feature as only requiring "some preprocessing." The Board assumed the preprocessing to be part of creating of these constructed fares in Gardner, but like the examiner, cannot point to where Gardner actually creates these fares, as opposed to merely accessing (already created) fares. This erroneous reasoning affects the Board's new rejection of claim 2.

In this new rejection, the Board reasoned that: "Those of ordinary skill knew that using such indexes and a hash table would have improved performance for constructing the fares in Garner (sic) and ATPCO, as evidenced by Tremblay and Wiederhold."²⁴ Appellant contends that there is nothing specific in Tremblay or Wiederhold that would suggest to one of ordinary skill that a hash table would have improved performance for constructing the fares in Gardner and ATPCO. This follows because nothing in Tremblay or Wiederhold mentions any details concerning "constructed fares." Despite the Board's findings regarding Tremblay and Weidenerhold²⁵, nothing in those references suggest the desirability of pre-processing and in particular the use of the claimed hash table in the context of the problem addressed by Appellant. This conclusion follows because

²³ Id. The board argued that:

We found that Gardner and ATPCO described all of the limitations of these claims, except for searching for cities indexed by those cities using a hash table, supra. Those of ordinary skill knew that using such indexes and a hash table would have improved performance for constructing the fares in Garner and ATPCO, as evidenced by Tremblay and Wiederhold.

²⁴ Board's decision page 20, line 5-8.

²⁵ Id. page 21.

neither of those references appreciated the recognitions made by the inventor regarding the structure of the data used to make "constructed fares."

The Supreme Court in *KSR Intl. Co. v. Teleflex Inc.*, 127 S.Ct. 1727 (2007), even while stating that: "the Court of Appeals drew the wrong conclusion from the risk of courts and patent examiners falling prey to hindsight bias," warns that: "a factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning."

The Court of Appeals, finally, drew the wrong conclusion from the risk of courts and patent examiners falling prey to hindsight bias. A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning. See *Graham*, 383 U. S., at 36 (warning against a "temptation to read into the prior art the teachings of the invention in issue" and instructing courts to "'guard against slipping into the use of hindsight'" (quoting *Monroe Auto Equipment Co. v. Heckethorn Mfg. & Supply Co.*, 332 F. 2d 406, 412 (CA6 1964))). Rigid preventative rules that deny factfinders recourse to common sense, however, are neither necessary under our case law nor consistent with it.

The Board's new rejection is a clear exercise in *ex post* reasoning. The Board's decision lays no basis for its conclusions that "some preprocessing necessarily occurred in Gardner" and that "Those of ordinary skill knew that using such indexes and a hash table would have improved performance for constructing the fares in Gardner and ATPCO." Merely because a reference discloses hash files for disk files on disk storage system as in Weidenerhold, does not provide any motivation to combine the teachings of the other references to suggest the claimed hash table in combination with the features of claim 2. Sustaining such an argument would doom every patent application to an unsupported while, at the same time, uncontestable obviousness rejection because it begs the question, as presented in this case: Why would the person of ordinary skill make the decision to use the claimed hash table arranged as in claim 2?

This motivation to combine Tremblay and Weidenerhold likewise cannot be obtained from Gardner, ATPCO, or the admitted prior art, because none of those sources provide any basis for why one of ordinary skill would have chosen to use hash tables in the first instance, as implicitly recognized by the Board, in refusing to sustain the examiner's original rejection.

Appellant contends that the Board has improperly used hindsight in rejection of claim 2, because the Board could have only gleaned the advantages of the hash table arrangement of claim 2 only from Appellant's claims and specification.

VIII. The combination of references should produce the claimed invention

The Board also finds that: "an airline fare data structure is essentially the same as an airline route structure, but with fares instead of distance."²⁶ The Board however does not provide the documentary evidence necessary to support this finding. The Board also finds that: "and because an airline route structure is a graph having a node for each origin and destination and an edge for each flight between each source and destination pair, the structure for airline fares used by Gardner and ATPCO are those of graphs."²⁷ The Board also does not provide the documentary evidence necessary to support this finding. The Board reasons that: "An effective data structure for representing such a graph is an edge list, which is indexed by each origin city [FF 31]." The Board has not shown that finding 31 has any bearing on the subject matter of claim 2. The Board reasons that: "Each edge represents a particular flight and therefore a particular airline. Thus each entry in the edge list would be indexed by the airline and the origin city." In the context of claim 2 however, the index is "airline, interior-city pair." The origin city in the context of the graph structure devised by the Board has no relevance to the interior city.

The Board concludes that:

Thus, one of ordinary skill would have searched pricing and flight schedules by Gardner and ATPCO using hash tables and indexes on airline and origin. The origin would have been an interior city for a flight starting in an interior city (claims 2, 5, 21, 23, 25, 26, 42, 52, 53, 54, and 55) and gateway for a flight connecting to a flight from an interior city (claims 4, 5, 21, 25, 42, 54, and 55).

Appellant contends that the Board developed reasoning that does not lead one of ordinary skill in the art to the claimed invention. Making of "constructed fares" does not depend on a search of flight schedules, as the Board reasons. Flight schedules have no relevance to constructed fares. The hash tables constructed by the Board i.e., "interior city for a flight starting in an

²⁶ Id. page 22.

²⁷ Id.

interior city” have no relevance to the claimed feature of “accessing a hash table indexed by an airline, interior-city pair to return a list of gateway cities for which an airline has arbitraries that specify the interior city.”

The Board, in its own precedents, has held that: “... the references must either expressly or impliedly suggest the claimed combination or the Examiner must present a convincing line of reasoning as to why one skilled in the art would have found the claimed invention obvious in light of the teachings of the references.” *Ex Parte Clapp*, 227 U.S.P.Q.2d 972, 973 (Board. Pat. App. & Inf. 985). Fundamentally, therefore, according to the Board’s own precedents the combination and reasons must produce at least something akin to the claimed invention.

The Federal Circuit has given the Board guidance in obviousness rejections. The Board has held that the burden of establishing a prima facie case of obviousness is on the board. See *In re Piasecki*, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787 (Fed.Cir.1984). According to the Federal Circuit, the board fulfills this burden when it shows that the references suggest to one of ordinary skill in the art, with all of the teachings of the references before him, the claimed invention. See *Orthopedic Equipment Co., Inc. v. United States*, 702 F.2d 1005, 1013, 217 USPQ 193, 200 (Fed.Cir.1983).

In view of these authorities it is clear that the Board’s reasoning and alleged combination of references must produce the claimed invention.

In the present case, the Board has failed to meet this burden, because by their own reasoning they have shown that something else, not the claimed invention, could be obvious over the alleged combination of references. Appellant contends that one of ordinary skill in the art, applying Tremblay and Weidenerhold to the primary references in the manner applied by the Board, may have developed something, but not a method to construct or produce “constructed fares.” Therefore, the Board’s reasoning cannot be considered as convincing.

KSR does not change this conclusion. Under *KSR* common sense still prevails. In Appellant’s view *KSR* does not change the standard that the showing must be of the claimed invention. *KSR* may have changed what constitutes suggestion or motivation to combine, but post-*KSR*, the claimed invention, and not something else, still must be rendered obvious. Thus,

under *KSR* common sense would dictate that to have proper motivation and a proper combination of references to teach the claimed invention, the reasoning and references must in fact produce the claimed invention and not something other than the claimed invention.

IX. The Board confused “memorization” processing and “memoization” processing.

The Board incorrectly reasons that Claim 9 further requires “determining if an entry in a construction table was memorized before accessing the construction table; and if the entry was memorized, retrieving an answer from a store of memorized entries, (emphasis added).”

The Board misapprehends or overlooks that Appellant’s claim 9 is not directed to memorization (emphasis added), as was found by the Board. Rather, claim 9 requires: “determining if an entry in a construction table was “memoized” before accessing the construction table; and if the entry was memoized, retrieving an answer from a store of memoized entries to apply to the constructed fare.” “Memoization” is disclosed by Appellant.²⁸ However, the Board based their decision on a different algorithmic technique “memorization,” (emphasis added) which the Board defined as data in memory.²⁹

“Memoization” involving construction tables is neither described nor suggested by any combination of the cited references. In sustaining the examiner’s rejection, the board reasoned that: “Since all of the data in Gardner’s databases [FF 191] are in memory, all such data are determined to have been

²⁸ See Appellant’s specification page 14, line 27.

Memoization is a technique for speeding up certain kinds of algorithms. If an expensive procedure is called many times, and if the procedure’s output depends only on the input (i.e., the answer is not dependent on any external factors, such as the current time), then memoization can be used. To memoize PO2 retrieval, the PO2 procedure call 80 forms a query 82 involving the constructed fare. The memoization retrieval process 80 has a store 88 of past queries and associated answers. If the memoization retrieval process 80 determines that the query has been stored, it is retrieved from the store 92. Otherwise, a procedure call for the PO2 record is produced and used to access the record from a remote database. The answer from the remote database is stored in the memoization store 88 for future references.

For subsequent calls for the record, the output from the memoization store 88 is used in response to a retrieval query for the PO2 records as it is called on every different input. That is, once the output for a certain input has been stored (i.e., the procedure has been called on that input once), the procedure does not need to be run again on that input. For the next call to the procedure on that input, the value is simply looked up in the memoization table. Because the PO2 matching process needs to be run many times for a single fare, memoization also improves performance.

²⁹ Since all of the data in Gardner’s databases [FF 191] are in memory, all such data are determined to have been memorized and are accessed accordingly. [Board’s Decision page 17, lines 23,24]

memorized and are accessed accordingly.” However, while having all data in memory may memorize the data; the argument and reasoning are not directed to the claimed feature of “memoization.”

As the Federal Circuit has consistently held, “if the claims were misconstrued, a finding of anticipation must be reversed unless the error was harmless.” *Gechter v. Davidson*, 116 F.3d 1454, 43 U.S.P.Q.2d 1030 (Fed. Cir. 1997). See also *Texas Instruments Inc. v. U.S. International Trade Commission* 854 F.2d 1327 (Fed. Cir. 1988) “This court has stated that once the claims of a patent have been improperly construed, that improper construction permeates, and typically disables, the entire remaining legal analysis. See *Moeller v. Ionetics, Inc.*, 794 F.2d 653, 656, 229 USPQ 992, 994 (Fed.Cir.1986) (stating that improper claim construction can distort an entire infringement analysis).”

The Board also argues that: “The Appellant contends that Gardner does not describe a memorization procedure (Appeal Br. 18:Third ¶). We find this argument is not commensurate with the scope of claim 9, which recites no limitation of memorizing, but merely determining whether an entry was memorized.” The Board also misconstrued this argument. Appellant argued that:

The examiner fails to point out this feature in Gardner and instead merely makes a reference to Fig. 8a fare component. However, Gardner does not teach a memoization procedure. The fare components are not memoized entries, e.g., the result of a memoized procedure previously acting on the entry.

Appellant's arguments were consonant with the scope of the claims.

While Appellant argued that Gardner did not teach a “memoization procedure,” the Board overlooks that Appellant also argued that: “The fare components are not memoized entries, e.g., the result of a memoized procedure previously acting on the entry” (as the examiner contended), and thus Gardner did not teach the features of claim 9. Appellant's argument did not require that claim 9 possess a memoization procedure. Rather, Appellant pointed out that had Gardner taught a memoization procedure, which it did not, then the examiner could have rightfully inferred that Gardner had memoized entries, which it did not.

Therefore, the absence of a "memoization procedure," "memoized entries," and the Board's clear misapprehension between "memorization" and "memoization" provide sufficient grounds for reconsideration and reversal of the Board's decision.

X. Conclusion

Reconsideration and reversal of the Board's March 10, 2008 decision is requested. Alternatively, clarification of the basis of the Board's reasoning is requested in order for Appellant to consider preparation of an appeal to the Federal Circuit.

Please apply any charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: May 5, 2008

/Denis G. Maloney/
Denis G. Maloney
Reg. No. 29,670

Fish & Richardson P.C.
225 Franklin Street
Boston, MA 02110-2804
Telephone: (617) 542-5070
Facsimile: (617) 542-8906